

What is claimed is:

1. A method of detecting motion in a mobile device, the method comprising the steps of:

(a) obtaining the horizontal and vertical numbers of macro blocks of a frame and initializing horizontal and vertical sizes of the macro block;

(b) moving a predetermined number of data in a column of the frame to a predetermined number of block buffers of an internal memory;

(c) performing motion detection on the data stored in the block buffers and counting up the vertical number of the macro blocks;

(d) ascertaining whether the motion detection is completed on the block buffers in a vertical direction, and if the motion detection is completed on the blocks in the vertical direction, initializing the vertical size of the macro block and counting up the location of the block buffers in a horizontal direction; and

(e) ascertaining whether the motion detection is completed on the block buffers in a horizontal direction, and if the motion detection is not completed on the blocks in the horizontal direction, it goes to the step (b).

2. The method of claim 1, wherein in the step (d), if the motion detection is not completed in the vertical

direction, a predetermined amount of macro block data is moved to a block location obtained by % operation.

3. The method of claim 2, wherein the % operation is used to determine the block location according to a mathematical expression $\{((\text{the vertical number of macro blocks}) + 2) \% 4\}$ if there are three macro blocks.

4. The method of claim 1, wherein when a search range is $[-16, 15]$,

the data is arranged in the 48×16 array in the vertical direction and the data is arranged in the 16×48 array in the horizontal direction so as to pack the data in blocks when moving the data;

the % operation is performed to make the buffers form a circular buffer;

buffer addresses is obtained with remaining values; and
similarity according to (i, j) on the circular buffer is found to obtain a SAD value.

5. The method of claim 1, wherein when a search range is $[-8, 7]$,

the data is arranged in the 32×16 array in the vertical direction and the data is arranged in the 16×32 array in the horizontal direction so as to pack the data in blocks when moving the data;

the % operation is performed to make the buffers form a circular buffer;

buffer addresses is obtained with remaining values; and
a similarity according to (i, j) on the circular buffer is found to obtain a SAD value.

6. The method of claim 1, wherein the motion estimation is performed when a search range is [-8, 7] so as to determine the size and the allocation of the fixed circular buffer for the search range [-16, 15],.